Detailed Design Notes: Flow Cards Activity

Rev 10-11-06

P' = Participant HO = Hand-out FC = Flip Chart

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OVERALL DESCRIPTION	General Description: The overall purpose of this activity is to provide a shared experience for participants to learn about flow, as a core concept in delivering services that will provide the most value for the customer while using the fewest resources. The activity can be used with 3 participants to up 20 or so. The greater the number of participants, the more time it will take. The activity can be completed in two rounds, taking less time and exploring fewer concepts, or it can be done in three or more rounds, with greater conceptual depth and breadth. The MDOL leadership team will be used the two-round version during their ***Leaning Into the Curve*** learning forums with all DOL staff. The two-round version is intended to take 45 minutes; the three-round can take 60 to 90 minutes, depending on how it is debriefed.	
MATERIALS REQUIRED	1. Two decks of regular playing cards – more decks if the group is larger than 13. 2. Kanban templates – one per participant 3. Two easels, with chart paper and dark colored markers, and masking tape 4. Two table signs: one saying START and the other FINISH 5. Watch or clock to tell time 6. Signal device to begin and end the round: a bell or simply your voice 7. Customer order card (pre-printed) 8. Posters that are pre-printed: (see samples at end of these design notes) a) Purpose of activity; b) Required Regulations; c) Lean Concepts d) Measurement Matrix for the Data Manager 9. Table with chairs so that participants can be seated around the table, in fairly close proximity of each other.	
SET-UP AND PREP (3")	Purpose: • Participants experience a well organized, confidant, competent, and professional learning experience. Methodology: • Room set-up: You may have to set up the table and chairs if they are not already. - Have participants sit at a table, in a circle, with a partial opening at the front. There is nothing on the table as they sit down. If there are materials on the table, clear the table of any debris before you start. - When everybody is seated, place the two table signs that designate **START** of the process and **FINISH** of the process when the customer receives the service or order. The signs are placed between the two people sitting where there is a partial opening in the circle. • Have to (2) FC easels, markers, and masking tape at front of room. - On one of the easels, post the **PURPOSE** of the activity, and on other the **REQUIRED REGULATIONS FOR THIS SERVICE**	

Time/Topic	Purpose and Method	Materials Resources

INTRODUCE ACTIVITY (5")
 	
• Purpose
• Introduction
• Regulations
• Signs
• Roles
	Purpose:
	• Align p's focus and efforts, and set a tone of learning and fun.
	
	Methodology:
	• Once all p's are seated, review the purpose of the activity by reading the poster: the purpose of this activity is to:
	  • Provide a shared experience to make key lean concepts more practical.
	  • Generate curiosity and stimulate your questions.
	  • Provide a concrete example of what continuous flow looks and feels like
	  • Illuminate how important communication is.
	• **Say to p's:**
	Imagine this process is producing a service of great value to the customer. Because you are all new to the organization, we want to orient you and provide some initial training. This process has only a few steps and like most things in state government, a few regulations.
	• Review the **Required Regulations** on poster/FC
	  • Every card must be turned over by every person.
	  • A club must be turned twice by each person.
	  • Each person must touch every card.
	  • Only first person can pull cards from the deck
	  • Only the last person can interact with the customer
	  • Customer will refuse an order that is not correct.
	
	• Point to the start and finish signs on the table.
	
	• ***Say, now, before we begin the actual "hands-on" training, we need to assign a few roles."***
	• Assign roles: You can ask for volunteers and have p's take customer and data manager roles, especially if you have a large number of p's. Or, one of the co-facilitators can take the role.
	- **CUSTOMER:** who will request service and decide if order is correct. Give the customer the card with the customer order information on it to whoever is the customer. Do not share with the whole group. If you don't have enough people, then the last person in the process can be the customer.
	- **DATA MANAGER**: who will keep time and measure our process. If the group is small, the co-facilitator can be the data manager.
	- SUPPLIER: This is the facilitator leading the activity who will feed material into the process. If you have lots of people, assign this to the co-facilitator.
	- **Direct Service Worker:** Last person in process who "ships" to the customer/ or in service terms, actually provides the direct service to the customer.
		• **Poster/FC** w/ purpose of activity
		• **Poster/FC**:
		- Regulations
		• Customer order card

PRACTICE ROUND (5")	Purpose: • Experience the rhythm of a continuous flow. Methodology:	

Time/Topic	Purpose and Method	Materials Resources
• Palms up • Chant	• ***Tell p's, "as part of your orientation we're going to practice without actually producing the service (no cards."*** • ***Ask p's to reach out with both hands, palms up. Say: I'd like each of you, in unison with me, to get into a rhythm of the flow of how we produce this service that the customer really values. Let's say out loud (chant) what we are doing.*** - ***<u>Receive</u> (with left hand)*** - ***<u>Transform</u> (passing from left to right and turning card over as you do)*** - ***<u>Send</u> (with right hand to next person that is receiving in their left hand)*** • ***Tell p's: We are assuming at this point, that each step adds value to the customer, and the end service is what the customer wants.***	
ROUND #1 (5") • Start timer • Supplier feeds cards - quickly • Customer gives order • Last person calls time when filled • Stop timer	<u>Purpose</u>: • Experience current state process and measure results. <u>Methodology</u>: • After a little practice, say to p's: ***We are now going to produce the service for the customer. The supplier (Me or whoever) will start handing a card to the first person in the circle, as that person receives the card in his/her left hand, they transform the request by passing from left to right, and turning the card over at the same time. Then with right hand, send to next person. Remember the regulations, and a club must be turned twice.*** • ***When I start, the timer will begin and the data manager will track the time. The timer will stand next to the last person and when the order is filled, the data manager will signal and stop the clock.*** • The supplier (the facilitator) starts feeding cards to the person who is seated at the START of the process. Go quickly, a little faster than group can process to be sure some bottlenecks occur, but not so fast to overwhelm them. • After the round begins, the customer gives the **CUSTOMER ORDER** to the organization - last person in the process. The last person is the only one who knows the exact order. • What the customer wants is (their order): 4 clubs 3 hearts 2 diamonds 1 spade • The last person has the order and puts the items in the order in one	• 2 decks of playing cards • Timer • Customer order request NOTE: Observe the cards through the round – count how many drops on floor and where the bottlenecks are.

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	location, and the unneeded cards in a pile separately. • This round stops when the customer order is filled or 3 minutes have lapsed (And the order has not been filled) • ***Transition: tell p's that we will now collect up the measures.***	
MEASURE PROCESS (5") • Complete measures FC • Ask customer if satisfied	Purpose: • To model the discipline of measuring process. • To demystify measurement as a complex, too hard to do, process • Motivate continuous improvement through the achievement of concrete, measurable results. Methodology: • When the data manager stops the process (the order is filled or 3 minutes have lapsed, facilitate the collection of the following measures and have the data manager write them on **FC**. Provide teaching points as appropriate. • **LEAD TIME** – how long to fill order, or 3 minutes - Time from start to finish; when supplier provided material to when customer order accurately filled. This is a way of measuring flow. • **WASTE** **a) # of cards on the floor** **b) # of cards last person had to set aside before they got the order filled** • **WORK LOAD BALANCE** **a) # of people with no cards or more than one card** - Work load balance is part of flow - Each step is a cycle and if we timed each step, it would be our cycle time measure. Each cycle is a beat in the flow. • **CUSTOMER SATISFACTION**: did customer get what they asked for? - This is a yes or no measurement. Ask the customer. We want 100% customer satisfaction. - Note: Customer should not have been satisfied, even if they got the cards. They should not have to "sort" their own order.	• **Poster/FC** a matrix with the measurements • See sample FC at end of these design notes.
DEBRIEF ROUND #1 (10") • Collect cards • Observe? • Improve?	Purpose: • Surface and explore key Lean concepts. • Generate improvement ideas. Methodology: • After measures are collected, collect up the cards • Then, ***ask p's: WHAT DID YOU OBSERVE?*** • Elicit their responses. Link their observations to lean concepts. Ask data manager or co-facilitator to FC observations • Some likely responses: - Somebody will usually say a person in the process was doing it wrong. That is, they "blame" the person for the failure, rather than the process. Teaching points: - People usually aren't doing it wrong, but the process doesn't allow them to do it right. - Process mindset – the filter we want to practice using when we are solving problems. - Root cause analysis – when we really examine why the problem occurred, the root cause analysis will help us solve this in a way that it will stay fixed.	• **FC** to record observations and improvement ideas

Time/Topic	Purpose and Method	Materials Resources
	• After you have gathered some of their observations, ***ask p's: HOW WOULD YOU IMPROVE THE PROCESS?*** • Ask the data manager to chart their ideas on a **FC**. • Facilitate and make explicit the link between the ideas generated in p's own words, and the lean concepts that they illustrate. • Note: this process lends itself to a FIFO lane with the Kanban delineating the first steps. There is too much WIP this way. • Transition: If a participant has not introduced the idea of pull versus push systems, or kanbans, facilitator introduces it.	
INSTALL KANBANS (5") • Pull? • Kanban? • Install kanbans	Purpose: • Introduce the notion of pull and how to apply it. Methodology: • ***Ask p's: what is the difference between a push system and a pull system?*** Elicit their responses. *Pull* means that no one upstream should produce goods or services until the customer downstream asks for it. [Note: review information in glossary to be able to provide teaching points.] • Say (if p's have not already) the first round we were "pushing" material through the system. Ask p's: *where was the focus of your attention?* Looking upstream, rather than downstream to the customer. • Creating a pull system improves flow, and value to the customer – theoretically. Let's see if it actually works. • Introduce the kanbans as a visual control. ***Elicit: Ask p's what a kanban is? Or to give an example of visual controls?*** • Give each participant a kanban and ask her or him to place it on his or her **right side** – looking downstream. Then, Instruct p's to: 1) Place one card only on the kanban corresponding to the suit. So that each kanban now has a total of 4 cards. [Observe for accuracy] 2) Tell p's that when a card is removed from the kanban, their job now is to replace the kanban. All other Regulations are still in place. 3) Repeat, they can only place a card on a kanban with an empty space. This is a pull, not a push. 4) Flow will go "counterclockwise" – from right to left.	• Kanbans • More cards I think this section still needs more clarity about our instructions. And, how to change the Kanbans for the third round so that there is even less WIP
Round #2 Kanbans (5") • Make changes • Customer gives order • Start timer • Last person "pulls" • When order filled, stop timer	Purpose: • Practice using a pull system. • Model continuous improvement Methodology: • Review the list of improvement ideas on the FC and see if there are any you can quickly implement (and that would not distract from the primary purpose of experiencing the pull system.) Make changes – remember you cannot violate the regulations. • Run round #2 • However: This time, the last person gets the customer order, and "pulls" to the exact order. So it will take a few seconds before the person at "start" actually fills the kanban to her or his right. When the person at "start" has an empty kanban, the "Supplier"/facilitator fills the kanban. • Be sure to start the timer and collect measurements the same as you	

Time/Topic	Purpose and Method	Materials Resources
	did in round #1	
MEASURE AND DEBRIEF #2 (5") • Measures • Feel? • Observe? • Improve?	Purpose: • Experience the difference in flow between push and pull. • Demonstrate the value of measurements. Methodology: • Elicit the measurements from p's and have the data manager chart them. • ***Ask p's: What did you observe?*** • ***Then ask, How do you feel?*** • ***If we had time to do a round #3, what would you improve?*** • Facilitate a group discussion, and make the link to the lean concepts.	
SUMMARIZE & CLOSE (3") • Key concepts • Application	Purpose: • Reinforce key concepts and provide a platform for further learning. Methodology: • Emphasize 5 basic concepts - **STANDARDIZATION** (Link to: stability, variation, - **FLOW** (continuous, rhythm, pull, upstream-downstream) - **MEASUREMENT** (Cycle time, lead time, waste, Cust. Sats.) - **WASTE** (Non-value added) - **CUSTOMER** • We can describe the rhythm and beat of the flow, through the cycle time and lead time. • Review the key concepts and provide input on ones that were not discussed. • Try to use p's language and examples as reinforcement the concepts. • ***Ask for examples of how this applies on their job?***	• Poster with concepts Note: If using this with CI-Practitioners would expand the list of concepts and do 3 or 4 rounds. And, if using this during a VSM, then all the concepts need to be addressed.

Posters and Materials

PURPOSE OF FLOW ACTIVITY

- Provide a shared experience to make key lean concepts more practical.
- Generate curiosity and stimulate your questions.
- Provide a concrete example of what continuous flow looks and feels like.

REQUIRED REGULATIONS

- Every card must be turned over by every person.
- A club must be turned twice by each person.
- Each person must touch every card.
- Only first person can pull cards from the deck
- Only the last person can interact with the customer
- Customer will refuse an order that is not correct.

MEASUREMENT CHART FOR DATA MANAGER

Measure	Round #1	Round #2	Delta
LEAD TIME Time from start to finish in minutes/seconds			
WASTE			
# cards on floor			
# of cards last person had to set aside before they got the order filled			
WORK LOAD BALANCE # people with no cards or more than one card			
CUSTOMER SATISFACTION - Yes or No			

SUMMARY (1) OF KEY LEAN CONCEPTS

CUSTOMER
FLOW
MEASUREMENT
STANDARDIZATION
WASTE

CARDS:

- Start
- Finish

CUSTOMER ORDER

- 4 clubs
- 3 hearts
- 2 diamonds
- 1 spade

Glossary of Terms for Facilitator Preparation

BALANCED WORKLOAD
An office/program where the capacity of all resources are balanced exactly with customer demand.

BATCH
Making or doing activities in groups, lots, or batches in which each part or finished good in the batch is identical. Can happen in both office/admin. and manufacturing environments. Creates 'waste'.

BOTTLENECK
A process in any part of the enterprise (office, production, sales, etc.) that limits the throughput of the whole process. Any resource whose capacity is equal to, or less than the demand placed on it.

BUILD-TO-ORDER
Designing, building, and delivering a service/product based on a customer-specific request. Pull is an important concept of Build-To-Order. Contrast to repetitive manufacturing.

CONTINUOUS FLOW
Each step/process (in the office or plant setting) makes or completes only the one piece that the next step/process needs, and the batch size is one - single-piece flow or one-piece flow. This is the opposite of batch-and-queue.

CONTINUOUS IMPROVEMENT
The never-ending pursuit of waste elimination by continually creating a better workplace, better products, and greater value to society. The process is never perfect -- as the name implies, with continuous improvement you are never done; even the improvement can be improved.

It is to institutionalize the practice of making many small improvements every day and improve overall efficiency. Continuous Improvement refers to the idea that a large number of small improvements in processes are easier to implement than major improvements and have a large cumulative effect.

COUNTERCLOCKWISE FLOW
A basic principle of Lean manufacturing cell layout is that the flow of material and the motion of people should be from right to left, or counterclockwise. The origin of this idea came from the design of lathes and machine tools with the chucks on the left side, making it easier for right-handed people to load from right to left.

CYCLE TIME
Cycle time is the time it takes to do one complete repetition of any particular task/step. Cycle time can be categorized into 1) manual cycle time, 2) machine cycle time, and 3) auto cycle time. If cycle time for every step/operation in a complete process can be reduced to equal *Takt* Time, the service/product can be made in Single-Piece Flow.

DOWNSTREAM PULL SYSTEM
See *PULL SYSTEM*.

ELEMENTS OF WORK
The elements of work are 1) value-added work, 2) non value-added work, and 3) waste. Thoroughly understanding the elements of work is a key first step to Lean thinking.

FLOW

In its purest form continuous flow means that items are processed and moved directly to the next process one piece at a time. Each processing step completes its work just before the next process needs the item, and the transfer batch is one. Also known as "one-piece flow" and "make one, move one".

INVENTORY
A major cost for most organizations/businesses; inventory is all raw materials, purchased parts, work-in-process components, and finished products that are not yet provided/sold to a customer. Inventory may also include “consumable” goods used in the process/production itself.

JUST-IN-TIME (JIT)
A system to make what the customer needs when the customer needs it in the quantity the customer needs, using minimal resources of manpower, material, and machinery – No More, No Less. The three elements to making Just-in-Time possible are Takt Time, Flow production, and the Pull system, as well as Standard Work. The opposite of Just-In-Time is “Just-In-Case” -- avoid this temptation.

JIT requires waste elimination, process simplification, set-up and batch-size reduction, parallel (rather than sequential) processing, and layout redesign. Just-In-Time approaches Just-On-Time when upstream activities occur minutes or seconds before down-stream activities, so that single-piece flow is possible. Just-In-Time is one of the two main pillars of TPS.

KAIZEN
The Japanese word for 'change for the ‘better' or 'improvement'. Kaizen is an improvement, continual improvement in personal life, home life, social life, and working life. In the workplace, Kaizen means continuing improvement involving everyone regardless of position. It is a business philosophy of continuous cost reduction, reduced quality problems, and delivery time reduction through rapid, team-based improvement activity. Continuous improvement through incremental improvements. Kaizen implies more than improvement in basic processes. Kaizen represents a philosophy within which an organization, and the individuals within it, undertakes continual improvements of all aspects of organizational life. The key to successful Kaizen is going to the worksite, working with the actual product/process, and getting the facts.

A system of continuous improvement in which instances of waste (Muda) are eliminated one-by-one at minimal cost. This is performed by all employees rather than by just specialists. [Same as *Process Kaizen*]

KANBAN
A Japanese word for 'sign', Kanbans are typically a card or other visual method of triggering the pull system based on actual usage of material. It is a central element of a Just in Time system. Kanbans are attached to the actual work/item/product, at the point of use. Kanbans are cards that have information about the parts (name, part number, quantity, source, destination, etc.) but carts, boxes, and electronic signals are also used. Squares painted on the floor to indicate storage or incoming areas are frequently, but mistakenly, referred to as kanbans.

LEAD-TIME
The total time a customer must wait to receive a product or service after placing the request. When a scheduling and production system is running at or below capacity, Lead Time and Throughput Time are the same. When demand exceeds the capacity of a system, there is additional waiting time and Lead Time exceeds Throughput Time.

LEAN

Lean is simply a thought process, not a tool, used to look at your business whether it is service, manufacturing, or any other activity where you have a supplier and a customer/receiver. The key thought processes within Lean are identifying 'waste' from the customer perspective and then determining how to eliminate it. Waste is defined as the activity or activities that a customer would not want to “pay” for and/or that add no value to the product or service from the customer's perspective. Once waste has been identified in the Current State, a plan is formulated to reach the Future State in an effective manner that encompasses the entire system. The term "lean" was coined by James P. Womack and Daniel T. Jones in their 1996 classic *Lean Thinking*, based on the Toyota Production System (TPS).

LEAN TRANSFORMATION
Developing a culture that is intolerant to waste in all of its forms. A successful Lean Transformation should result in a Lean Enterprise, an organization that is engaged in the endless pursuit of waste elimination.

MUDA
The Japanese word for 'waste.' Any activity that adds cost without adding value to the product. Any human activity that absorbs resources but creates no real value. [See *Non-Value-Added*, *Waste*]

NON-VALUE-ADDED WORK
Activities or actions that may or may not be necessary but do not add real value as defined by the customer, making such activities or action a form of waste.. Examples are packaging, paperwork, and inspection. Non-value-added tasks can create value if their function is to identify and eliminate waste.

PROCESS
In the field of reengineering, total quality, and lean, a definition of process is *a combination of people, resources, and methods that produce a result. Processes transform inputs into outputs.* All work is a process - and processes can be defined and measured, and methods can be standardized. One can define the action steps required to achieve an end and then refine those steps to achieve the outcome more effectively and efficiently – process improvement.

PULL SYSTEM
To produce or process an item only when the customer needs it and has requested it: Use One; Make One. The customer can be internal or external. An essential part of any *Build-To-Order* strategy. Having set up the framework for *Flow*, the next step is to only produce what the customer needs. *Pull* means that no one upstream should produce goods or services until the customer downstream asks for it. Contrast this concept to *Push*.

One of the 3 Elements of *Just-In-Time*. The pull system enables the production of what is needed, based on a signal of what has just been “sold.” The downstream process takes the product they need and 'pulls' it from the producer. This 'customer pull' is a signal to the producer that the product is sold. The pull system links accurate information with the process to minimizes overproduction.

PUSH SYSTEM
To produce or process an item without any real demand from the customer – usually creates inventory and all other 'wastes'. In contrast to the *Pull* system, the service/product is pushed into a process, regardless of whether it is needed right now. The pushed product goes into inventory, and lacking a pull signal from the customer indicating that it has been used/bought,, more of the same service/product could be overproduced and put in inventory. In a *Push* System, creating/producing more of an item or service is based on the anticipation of its use. A Push system attempts to predict when the item/service/material will be needed and will launch its processing in anticipation of this need.

STANDARD WORK

Specifying tasks to the best way to get the job done in the amount of time available while ensuring the job is done right the first time, every time. Standard Work is the most efficient, optimum combination of man, machine, and material. The three elements of standard work are 1) Takt Time, 2) Work Sequence, and 3) Stand Work-in-Process. Performing standard work allows for a clear and visible 'standard' operation. Deviation from standard work indicates an abnormality, which is then an opportunity for improvement.

Standardized work is organized around human motion and creates an efficient production sequence without any waste. It consists of three elements: Takt-Time, Working Sequence, and Standard In-Process Stock.

TAKT TIME

Takt time is the pace at which the customer is buying a particular product or service. Takt time is the total net daily available "operating" time divided by the total daily customer demand. Takt time is not how long it takes to perform a task. Takt time cannot be reduced or increased except by changes in production demand or available time to work. Used in Lean as the rhythm of the process, i.e., if the customer wants a service every hour, the program/office should feel the heart beat of producing a service every hour. Takt is a German word for 'pace,' 'beat,' or 'rhythm'. Takt time is one of the 3 Elements of JIT.

TAKT TIME**:** Total available processing time (minus all planned activities such as breaks, check-ins, safety meetings, etc. not available) divided by the customer's requirement/demand.

For Example:

- (1) 8 Hour Shift = 480 Minutes minus (2) 10 Minute Breaks = 460 Minutes available time
- 1840 Claims/Day Customer Demand/Requirements

➢ TAKT Time = .25 minute or 15 seconds (*One claim would have to be processed – at every step -- every 15 seconds in order to meet the customer demand*.)

TOYOTA PRODUCTION SYSTEM (TPS)

A methodology that resulted from over 50 years of Kaizen at Toyota, one of the most successful companies in the world. TPS is built on a foundation of Leveling, with the supporting pillars of Just-in-Time and Jidoka.

VALUE

A product or service's capability provided to a customer at the right time, at an appropriate cost/price, as defined in each case by the customer. What does and does not create value is to be specified from the customer's perspective and not from the perspective of individual organizations, functions, and departments.

VALUE-ADDED ANALYSIS

With this activity, a process improvement team strips the process down to its essential elements. The team isolates the activities that, in the eyes of the customer, actually add value to the service or

product. The remaining non-value-adding activities ("waste") are targeted for improvement or extinction.

VALUE-ADDED WORK
Activities or work essential to ensure a product or service meets the needs of the customer -- work that the customer is willing to pay for. A transformation of the shape or function of the material/information in a way that the customer will pay for. Activities or actions taken that add real value to the product or service. [See *Non-Value-Added*]

VALUE STREAM
All activities, both value-added and non-value-added, required to bring a product or service from request/order to the hands of the customer, and a design from concept to launch to production to delivery. By locating the value-creating processes next to one another and by processing one unit of work at a time, work flows smoothly from one step to another and finally to the customer. This chain of value-creating processes is called a value stream. A value stream is simply all the things done to create value for the customer. It is a series of all actions required to fulfill a customer's request, both value-added and not.

VALUE STREAM MAPPING (VSM)
A VSM is a Lean tool used to visualize the value stream of a process, department, or organization. Creating a picture of the complete material and information flow from customer request through order fulfillment for an operation. Value Stream Mapping can be done at an enterprise level (showing customer-supplier relationships as well as distributors), a door to door level showing the flow of material and information primarily within a factory, office, or hospital operation, and a process level map with a narrower scope and more detail. The 'Current State' is how the process works today and the 'Future State' map shows improvements towards a long-term 'ideal state'.

It is a hands-on, pencil-and-paper tool used: a) to follow a product or information (or both) activity path from beginning to end and draw a visual representation of every process (value and non-value) in the material and information flows; b) then to design a future state map which has waste removed and creates more flow; and c) to end up with a detailed implementation plan for the future state.

VISUAL CONTROLS
Displaying the status of an activity so every employee can see it and take appropriate action. It is the placement in plain view of all tools, parts, processing activities, and indicators of process system performance, so everyone involved can understand the status of the system at a glance. Various tools of visual management such as color-coding, charts, andons, schedule boards, labels and markings on the floor.

VISUAL MANAGEMENT
When the normal state and abnormal state can be clearly and visually defined, visual management is possible. In visual management, simple visual tools are used to identify the target state, and any deviance is met with corrective action

WASTE
Anything that uses resources, but does not add real value to the product or service. Anything that does not add value to the final product or service, in the eyes of the customer. An activity the customer wouldn't want to pay for if they knew it was happening. [*See Muda]*

8 WASTES
There are 8 types of waste that describe all wasteful activity in a work environment. Elimination of the 8 wastes leads to improved results/outcomes. The 8 wastes are 1) Overproduction, 2)

Transportation, 3) Excess Motion, 4) Waiting, 5) Over-processing, 6) Inventory, 7) Errors/Defects, and 8) Underutilized People.